SIERRA CLUB BULLETIN.

VOL. V. SAN FRANCISCO, JUNE, 1904. NO. 2.

MOUNT WHITNEY AS A SITE FOR A METEOROLOGICAL OBSERVATORY.

BY ALEXANDER G. MCADIE, PROFESSOR OF METEOROLOGY.

(From Monthly Weather Review for November, 1903.)

In reply to a letter dated June 15, 1903, from the Chief of the Weather Bureau, asking for a report on the advantages and disadvantages of Mt. Whitney as a site for a meteorological observatory in connection with the proposed astrophysical observatory, the accompanying notes based on observations made during a hasty trip to the summit in July, 1903, in company with the Sierra Club of San Francisco were submitted.

Accessibility.—Mt. Whitney is situated in latitude 36° 34′ 33″ north, and longitude 118° 17′ 32″ west. It may be reached in several ways.

I. From Lone Pine on the Carson and Colorado Railroad, along the county roads to Carroll Creek, up zigzags of a trail, across Cottonwood Creek to Horseshoe Meadow, a climb of nearly 5,000 feet in ten miles, and thence by trail to Volcano Mountain.

II. By trail from the Kern River, at its southern end, working north along the Kern River to the East Fork, thence south to Crabtree Meadow, thence to Lang-

ley's Camp on the eastern side of Mt. Whitney, 2,800* feet below the summit.

III. From the northern end of Kern River, working south to East Fork, thence as in II.

The trails on the western side of the mountain are not steep, nor especially difficult and dangerous. A good climber can go from Langley's Camp to the summit in less than four hours.

On the top of the mountain, or peak, is a flat of several acres. On the extreme eastern edge a small mounment of rocks has been erected. The eastern side of the peak is precipitous, a sheer fall of about 6,000 feet sharply marking the mountain. About 11,000 feet below the summit lies the valley of Owens River, with Owens Lake to the southeast. On a clear, quiet day Lone Pine, almost directly east of Mt. Whitney, and distant about fifteen miles, can be seen. Independence, lying to the north-northeast, is hidden by a ridge. Between Independence and Lone Pine six streams flow to the east. The most important of these is Lone Pine Creek, which flows down from Mt. Whitney. According to the report of Mr. Charles C. Garrett, Observer at Independence, Cal., dated June 17, 1903, the quantity of water in this creek is as follows:—

"The flow of the stream varies very much in different years. Measurements taken two days ago at my request showed a flow of 660 miners' inches. The water is now at its highest point, and this is regarded as an average year. It is probable that at the time of lowest water not more than 80 inches flow. Measurements were taken in the months of October and December, 1893, for testimony in a water suit, and flows of 195 and 160 inches, respectively, were found. The principal owner of the waters of Little Pine Creek informs me that, in his opinion, the average flow of the stream for an average year is about 300 miners' inches."

* Three thousand feet is probably a more accurate figure.

On the eastern side of the mountain there are at least four lakes within three miles. There is a splendid supply of good water at Langley's Camp. Mt. Whitney is in the Mt. Whitney Military Reservation, and I am under the impression that one of the reasons urged in establishing the reservation was the desire to retain it for use as a station for scientific research.

The peculiar character of Mt. Whitney renders it a good site for meteorological work, inasmuch as comparisons can be made of the conditions in the free air over a confined and heated valley and the conditions existing on the westward slope of the Sierra, or plateau conditions. While we were on the summit a lady's veil was thrown over the eastern edge, and, although the temperature was but 53°, it was plain that there were high temperatures and strong ascensional currents on the eastern side of the mountain. The course of the veil was such as to suggest that with regard to the general flow of the air from west to east the mountain acts as a dam, or weir.

It is probable that for the greater portion of the year the peak is accessible. The average precipitation in this section is not very large. Snow remains in the crevasses until August or September. At the time of our ascent, July 8, 1903, we passed across one crevasse, which, however, could have been avoided by making a detour south of the gully. I do not know that the peak has ever been ascended in winter, but I believe there might be periods when this would be possible. No one of the other high mountains on the Pacific Slope, such as Shasta or Rainier, is so easy to climb as Mt. Whitney. Owing to the fact that the two peaks mentioned lie farther north and in the track of atmospheric disturbances, climbing is almost out

of the question in winter, and hazardous even in summer. Mt. Whitney, therefore, of all the extremely high peaks on the Pacific Coast, is probably most suitable for a meteorological observatory.

All materials would have to be carried up by pack-train. I made some inquiry as to prices for this work, but could obtain no trustworthy estimates.

The Elevation of Mt. Whitney.—As will be seen below, few mountain elevations have been discussed more carefully than that of Mt. Whitney. Some barometric observations were made on our trip, although it was a hasty one and not altogether favorable for such work. Fortunately the weather conditions were very favorable. The greatest care was taken by Professor J. N. Le Conte and myself to read carefully, and independently of each other, the heights of the mercurial column. Our chief purpose was to correct the prevailing estimate of the height of Mt. Whitney—viz., 14,900 feet, an elevation given on most of the maps in use in California.

Gannett, in his "Dictionary of Altitudes in the United States" (third edition, 1899), gives an elevation of 14,898 feet, and this we believe to be erroneous. The authority given is Whitney, but I am unable to ascertain if Professor Whitney made the ascent and measurement, or, as chief of the Geological Survey of California, used the measurement made by Carl Rabe for the survey. This latter was the first measurement of Mt. Whitney. His readings, as marked on the case of the mountain mercurial barometer (Green No. 1554) used by him, are 17.836 inches, 32°; 17.848 inches, 42°.

The elevation deduced from the above readings was

14,898 feet, or exactly the same as the figures given by Gannett. This elevation, however, does not seem to be in accord with the readings, and if the altitude is determined on the assumption that the correction applied to the barometer was the same as applied in our observations (a doubtful assumption, it is true), the elevation would be about 13,701 feet, the sea-level pressure on that date being 30.01 inches at the given hour, the value of the mean temperature being 37.5° F., and the corrected reading at Mt. Whitney being 17.915 inches.

Two mercurial barometers were carried from San Francisco to Mt. Whitney summit and read at half-hourly intervals by Professor J. N. Le Conte, University of California, and myself. One of the barometers was the same instrument used by Rabe (Green No. 1554). Our readings on the summit were as follows:—

SUMMIT OF MT. WHITNEY, JULY 8, 1903. OBSERVERS: J. N. LE CONTE AND A. G. McADIE.

Pacific Time.	Green, No. 1554.		Green, No. 1664.	
	Barometer.	Attached thermometer.	Barometer.	Attached thermometer.
	Inches.	°F.	*Inches.*	°F.
9:30 a. m.	17.630	51	17.652	54
10:00 a. m.	17.638	51	17.652	55
10:30 a. m.	17.646	55	17.660	55
11:00 a. m.	17.650	55	17.660	54
11:30 a. m.	17.650	50	17.667	52
12:00 noon	17.650	49	17.668	51
12:30 p. m.	17.652	48	17.674	54
1:00 p. m.	17.654	49.5	17.674	53
	17.646	51.7	17.663	
	— 0.036*		— 0.041*	
	17.610		17.622	
	+ 0.088†		+ 0.068†	
	17.698		17.690	

* Reduction to standard temperature.

† Sum total of the probable instrumental error, scale correction, capillarity, and gravity corrections for latitude 37° and for altitude 15,000 feet.

The mean of our pressure-readings on the summit was 17.690 inches, while the mean of the Langley readings was 17.588 inches. There are only four of the series by Langley which were taken at hours comparable with ours, —namely, September 4, 8:30 A.M.; September 5, 12:40 P.M.; September 6, 8:17 A.M.; and September 6, 9 A.M. The mean of these corrected and reduced is 17.609 inches. The difference, therefore, is but 0.081 of an inch. The temperatures also agree fairly well.

Professor Langley gives the elevation of Mt. Whitney as 14,522 feet, or 10,762 feet above his base-station at Lone Pine.*

We found deposited on the summit a record of an ascent made on August 23, 1902, by Professors Kellogg, Hallock, Putnam, and others, in which it is stated that the temperature was then 34° F., and the boiling-point, as determined by William Hallock, 186.4° F. It is interesting to note that the pressure corresponding to this boiling-point would be 17.58 inches.

On October 8, 1895, Hutchings and others ascended the mountain and reported that water boiled at 187° F.

Wheeler's Determinations.—Wheeler gives as the height† determined by the adopted mean of barometric observations made by the observers of his survey party of 1875, 14,471 feet. The mean of three readings, at half-hour intervals, on September 24, 1875, after being corrected and reduced, was 17.796 inches; temperature, 35.3°; wet-bulb reading, 29.0°. A similar mean for October 13, 1875, was 17.840 inches; temperature, 36.7°;

* The exact elevation of the station at Lone Pine is uncertain.

† "United States Geological Surveys West of the One Hundredth Meridian." Wheeler, 1889, p. 95.

wet-bulb reading, 32.2°. The corrections applied are not accessible, but the records are probably in the office of the Chief of Engineers, U. S. Army.

"It is," says Wheeler, "the highest point measured by careful barometric observations within the territory of the United States, except Alaska."

The record of the observations made by Rabe in 1873, with the barometer, Green No. 1554, is as follows:—

Barometer.	Attached thermometer.
Inches.	°*F.*
17.836	33
17.848	42
17.842	38
— 0.015*	
17.827	

* Reduction to standard temperature.

These readings, corrected for temperature only, differ from the values obtained by us, by + 0.217 inches. The difference from the readings of the other barometer (Green No. 1664) was + 0.205 inches.

It will be noticed that in the readings made in 1903 there is a decrease in temperature during the observations, as shown by both attached thermometers, and moreover the temperatures themselves are not similar. Barometer No. 1554 is a small mountain barometer with a scale reading from twenty-four to eleven inches. Barometer No. 1664 has a scale reading from thirty-three to fourteen inches. Both instruments were filled with clean mercury June 23, 1903, and the longer instrument carefully read and compared with station barometer No. 387 in the Weather Bureau office at San Francisco. Its

mean correction was + 0.068 inches. It may be questioned whether this correction properly applies to readings at high elevation, but for the present we will assume that it does so.

We must consider next the various simultaneous base readings.

Hour (Pacific Time).	Mount Whitney.	Independence. Elevation 3910 feet.	Mount Tamalpais. Elevation. 2375 feet.	San Francisco. Elevation 155 feet.
10 a. m.	17.680	25.965	27.55	29.90
11 a. m.	17.689	25.953	27.56	29.89
12 noon	17.701	25.936	27.56	29.88
1 p. m.	17.704	25.919	27.56	29.86

The above are the so-called station-pressures,—that is, the observed readings corrected for temperature, scale correction, capillarity, and gravity. Independence is the Weather Bureau station nearest to Mt. Whitney, and the observations were made at that point by Mr. Charles C. Garrett.

The sea-level pressures at Independence and at San Francisco were as follows:—

Hour.	Independence.	San Francisco.
10 a. m.	29.88	30.06
11 a. m.	29.86	30.05
12 noon	29.85	30.04
1 p. m.	29.82	30.02
Mean	29.85	30.04

The observations at San Francisco and at Mt. Whitney are probably the most satisfactory of all, and these we shall proceed to use in determining the true elevation.

Professor Bigelow's modification of the Laplacian equation, as given on page 490, equation 60, of his "Re-

port on International Cloud Observations," (Vol. II of the Report of the Chief of the United States Weather Bureau, 1898–99), or equation 52, p. 66, of his "Report on the Barometry of the United States," etc., (Annual Report of the Chief of the United States Weather Bureau, 1900-1901, Vol. II), is as follows:—

$$h - h_0 = (56517 + 123.3\theta + 0.003h)$$

$$\left(1 + 0.378\frac{e}{B}\right)(1 + 0.0026 \cos 2\phi) \log \frac{B_0}{B}.$$

Using the values for 10 A.M. July 8, $B_0 = 30.06$ inches, as at San Francisco, $B = 17.680$ inches, as on Mt. Whitney, and a mean temperature $\theta = 53°$, we obtain

$$\log B_0 = \log B + \frac{h - h_0}{56517 + 123.3\,(53) + 0.003h}\Big(1 - \beta\Big)\,(1 - \gamma\Big),$$

whence $h = 63096 \times 0.230507 = 14{,}515$ feet.*

Previous Determinations of Altitude.—On page 201 of his "Researches on Solar Heat" (Professional Paper of the Signal Service No. 15), Professor Langley gives what is probably the best series of observations as yet made on Mt. Whitney. The observers were Mr. E. O. Michaelis, Mr. J. J. Nanry, and Mr. J. E. Keeler.

The readings given in Table 173 of his work are as follows:—

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* Prof. Abbe having kindly pointed out that I had not made full use of the Independence readings, I give herewith the following values: 10 A.M., 14,441 feet; 11 A.M., 14,414 feet; noon, 14,378 feet; 1 P.M., 14,355 feet, which, as the editor remarks, are to be considered as only a portion of a continuous 24-hour series. Having also seen Mr. Heiskell's computations, I would add that the values 14,530 and 14,532 obtained by him by using the Bigelow tables agree with the values obtained above in which the value of θ was 53°, or a degree less than that used by him. Recomputing the elevation, but using a temperature of 54° and sea-level pressure of 30.06, my computation gives 14,572. The sea-level pressure used by Mr. Heiskell was 30.04 inches and the station-pressures 17.694, which, according to the method of computation used above, would give an elevation of 14,534 feet.—A. M., November 20, 1903.

READING OF BAROMETER NO. 2018, SIGNAL SERVICE, ON THE SUMMIT OF MT. WHITNEY.

Date.	Time.	Reading.	Attached thermometer	Reading.*
1881.		*Inches.*	° *F.*	*Inches.*
September 2 . . .	6:00 p. m.	17.600	30.0	17.599
2 . . .	9:00 p. m.	17.597	26.5	17.603
2 . . .	12 midn't	17.569	25.5	17.576
3 . . .	3:00 a. m.	17.529	22.5	17.540
3 . . .	6:00 a. m.	17.518	22.5	17.529
3 . . .	8:15 p. m.	17.514	28.2	17.516
4 . . .	8:30 a. m.	17.627	52.8	17.591
5 . . .	12:40 p. m.	17.600	62.5	17.546
5 . . .	5:07 p. m.	17.680	61.5	17.628
5 . . .	6:30 p. m.	17.640	42.0	17.622
5 . . .	8:20 p. m.	17.599	38.0	17.588
5 . . .	10:22 p. m.	17.558	32.0	17.555
5 . . .	12 midn't	17.558	31.5	17.555
6 . . .	1:00 a. m.	17.610	30.0	17.610
6 . . .	3:00 a. m.	17.610	30.0	17.610
6 . . .	5:00 a. m.	17.610	28.0	17.613
6 . . .	8:17 a. m.	17.692	52.0	17.657
6 . . .	9:00 a. m.	17.680	54.4	17.640

Professor J. N. Le Conte, on July 8, 1903, made measurements of the height by angles of elevation and depression between Old Camp Independence, Lone Pine, and the Peak and return, and obtained a result of 14,470 feet.†

Historical Notes.‡—The mountain was first seen from Mt. Brewer by members of the Geological Survey of California, Brewer, King, and others, in 1864, and named Mt. Whitney. On August 18, 1873, John Lucas, C. D. Bigole, and A. H. Johnson, climbed the peak and called it Fisherman's Peak. On September 1, 1873, Clarence

*Corrected for temperature and reduced to Signal Service standard, but not for gravity.

†But this depends upon the height of Lone Pine depot; and this in turn upon the elevation of Mound House on the Virginia and Truckee Railroad.

‡References: Langley—"Researches on Solar Heat." Wheeler—"Surv s West of One Hundredth Meridian, 1889." Stewart—*Mt. Whitney Club Jou al*, Visalia, Cal. Le Conte—SIERRA CLUB BULLETIN.

King, then in New York, learned that the peak which he had climbed in 1871, now known as Sheep Mountain, Old Mt. Whitney, and Mt. Corcoran (Bierstadt), lying to the south of Whitney, was not Mt. Whitney, and hastening West climbed the right peak September 19, 1873. On September 6, 1873, the mountain was climbed by Carl Rabe, and the first mercurial barometer (Green, No. 1554) carried to the summit. Professor Langley's expedition is well known. He reached Lone Pine on July 24, 1881, and left on September 10th by way of Lone Pine Cañon. The journey, in brief, is described in pages 36 to 44, Professional Paper No. 15, Signal Service, published in 1884.

I cannot do better than quote Professor Langley's statement, given on page 44:—

"I do not think the Italian Government, in its observatory on Ætna, the French in that of Puy de Dome, or any other nation at any other occupied station, has a finer site for such a purpose than the United States possesses in Whitney and its neighboring peaks; and it is most earnestly to be hoped that something more than a mere ordinary meteorological station will be finally erected here and that the almost unequaled advantages of this site will be developed by the Government."

COMPUTATION OF THE ALTITUDE OF MT. WHITNEY.

(A report by Mr. H. L. HEISKELL to Prof. F. H. BIGELOW, dated Oct. 2, 1903.)

Relative to the observations made on Mt. Whitney, Cal., by Professor McAdie on July 8, 1903, at 10 A.M., 11 A.M., noon, and 1 P.M., and used by him in connection with simultaneous observations taken at Independence, San Francisco, and Mt. Tamalpais, to determine the height of the summit, I find that the observations are too few, and taken at a bad time of the day, to give any very accurate results.

Three essential elements must be considered in barometric hypsometry: temperature, pressure, and vapor-pressure, and the observations should be taken at different times of the day and on different days, so as to obtain a true mean; an error of one degree in mean temperature causes an error of twenty feet in the height of Mt. Whitney; an error of .001 of an inch in pressure causes an error of one foot in the computed height. In these observations the attached thermometer is read for temperature and there are no hygrometric observations; then again the temperature at Independence, etc., was taken from the thermograph, so that a possible error of from one hundred to two hundred feet is not improbable.

From the data available, using your formula in your Barometry Report, I make the height of Mt. Whitney as follows:

	Feet.
By using the simultaneous observations taken by the observer at Independence and by Professor McAdie at Mt. Whitney, the elevation is.....	14,651
San Francisco and Mt. Whitney.....	14,532
Mt. Tamalpais and Mt. Whitney.....	14,618
Mean	14,600

If we reduce the observations at Independence, San Francisco, and Mt. Tamalpais to sea-level, and then compute to Mt. Whitney, we have—

	Feet.
Independence and Mt. Whitney.....	14,590
San Francisco and Mt. Whitney.....	14,532
Mt. Tamalpais and Mt. Whitney.....	14,595
Mean	14,572

or a difference of twenty-eight feet from the preceding.

Professor McAdie, using observations taken at San Francisco only, calculates the height at 14,515.

On September 2, 3, 4, 5, 6, 1881, Professor Langley had a very accurate and careful series of eighteen simultaneous observations taken at Lone Pine and Mt. Whitney and published in his "Researches on Solar Heat." His barometers were carefully compared, and his temperature and hygrometer observations were made by experienced observers, so that the accuracy of the work can hardly be questioned. In 1900 Mr. Gannett deduced from railroad-levels the elevation of Lone Pine at 3,661 feet above sea-level, but in 1881 the height of Lone Pine was given by Mr. George Davidson to Professor Langley as 3,760 feet, or nearly 100 feet higher. The means of eighteen simultaneous observations at the two points are as follows:—

LONE PINE.		MT. WHITNEY.	
Pressure.....	26.018	Pressure.....	17.586
Temperature.....	69.57	Temperature.....	37.20

Using the height of Lone Pine, as given by Mr. Gannett in 1900 (3,661 feet), and the barometric observations of Professor Langley, I make the height of Mt. Whitney 14,423.

Professor Langley, in his report, using 3,883 feet for Lone Pine and his own barometric work, says Mt. Whitney, by barometer observations, is 14,625.

Professor Langley, by using Davidson's altitude (3,760 feet) for Lone Pine and barometer observations at Mt. Whitney, makes the height 14,522.

On August 17 to September 7, 1881, Professor Langley had sixteen simultaneous observations taken at Lone Pine and Mountain Camp to determine the height of the camp. To see how we agree on that height I herewith give the data: Using Davidson's height of Lone Pine

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(3,760 feet), the height of Mountain Camp is 11,624; using Gannett's height of Lone Pine (3,661 feet), Mountain Camp is 11,525. Professor Langley makes Mountain Camp 11,625.

From the above, I should say that the approximate heights are: Lone Pine (Gannett), 3,661; Mountain Camp (Gannett and Langley), reduced by me, 11,525; Mt. Whitney (Gannett and Langley), reduced by me, 14,423.

I should, therefore, suggest that the adopted height of Mt. Whitney be about 14,423 feet, as determined by using Professor Langley's observations and Professor Gannett's height in 1900 for Lone Pine.*

COMPUTATION OF THE ALTITUDE OF MT. WHITNEY.

Under date of January 11, 1904, Professor Joseph N. Le Conte, of the University of California, says:—

"The Lone Pine railroad station is on the main line of the Carson and Colorado Railroad, and is on the eastern side of Owens River, close to the base of the Inyo Range. The town of Lone Pine is on the western side of the valley and on the western side of the river also. The distance between the two points is about three miles, and the railroad station bears about north 60° east of the town. I visited the railroad station last September and spent some time with Mr. McGrath, the division superintendent. His memory of the altitude of the rail at the station, namely, 3,658 feet, was afterward corroborated in a letter from him to me after consulting the records of the survey at Carson City, Nev. Mr. Henry Gannett gives the same number in his "Dictionary of Altitudes," evidently obtained from the same source. This, however, is not the altitude of the point occupied by Professor Langley in his determination of the height of Mt.

* A letter from Professor McAdie makes it very doubtful whether the hamlet "Lone Pine," occupied by Professor Langley in 1881, is the same as the railroad station "Lone Pine," subsequently established.

Whitney. There has never, to my knowledge, been a line of levels run between the two places, and the only determination of the height of the town that I have ever found is the one given by Captain Wheeler—namely, 3,810 feet; this, however, is barometric.

"There is a 'railroad tangent' at Lone Pine station over twenty miles long. It is absolutely straight and nearly level. It would be easy to measure off a base line four or five miles long, and arrive at a good measure of the elevation of the mountain; this might be still further improved by simultaneous angles observed from the mountain and the station. Such a measurement would depend on the elevation of the rail, of course, but this I think can be checked up. A survey has been run from this point to Mojave on the line of the Southern Pacific near Los Angeles. If the results of this latter survey could be obtained, we would know better how much reliance to put on the figures 3,658. It has long been a desire of mine to make this triangulation, for the angle of elevation is over 6° and the distance fifteen miles only. But I could not put very much faith on the levels over 550 miles of such rough country."

Under date of January 16, 1904, the Director of the United States Geological Survey, says:—

"Regarding the relative elevation of the railway station near Lone Pine, Cal., and the barometric station in that town occupied by Professor Langley, the only information that I have been able to get is to the effect that the difference in elevation is slight, probably not exceeding ten feet, the site of the town being the higher.

"More to the purpose, however, is the fact that this office has run a line of levels from the sea through the San Joaquin Valley, and up the south fork of the Kaweah River to Farewell Gap, thence connecting by vertical angles with the summit of Mt. Whitney, obtaining, as a result, 14,434 feet. I do not consider this result as conclusive, inasmuch as the last link in the chain consists of a single vertical angle at a distance of thirty-four miles."

THE WATER-OUZEL AT HOME.*

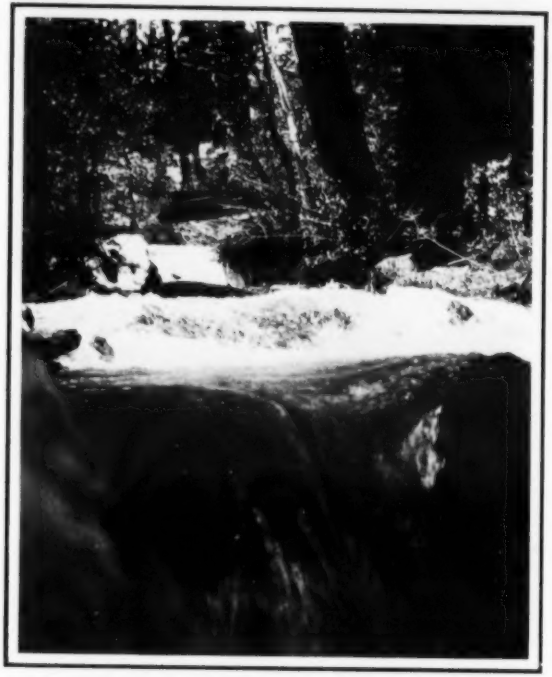
By William Frederic Badè.

The avifauna of the Kern Cañon, especially at the head-waters of the Kern and in the neighborhood of the Kern lakes, proved both varied and interesting even to a casual observer during the Sierra Club outing of 1903. The Steller jay (*Cyanocitta stelleri*), the Clarke nut-cracker (*Nucifraga columbiana*), the Louisiana tanager (*Piranga Ludoviciana*), the Arctic bluebird (*Sialia arctica*), juncos, several species of hawk and grouse, Brewer's blackbirds (*Scolecophagus cyanocephalus*), and the water-ouzel (*Cinclus Mexicanus*), were among the commonest of the feathered folk seen near Camp Olney. The last-mentioned bird I had seen for the first time on the upper Klamath River—a bobbing, bowing, winking compound of many avian charms. But it was not the winsome bird I learned to know on the banks of the Coyote. One morning (July 2d) I was casting the fly on a few foam-flecked pools near its junction with the Kern. Fed by the melting snows of the Great Divide, every morning found the creek at its fullest, for then it was carrying past Camp Olney the increment of the previous day's thaw. A keen ear could easily detect in the thunder of its falls a fuller crescendo, and the water leaped from the escarpments with greater abandon. True to her name the water-ouzel was there in her favorite environment of alder, pines, and flying spray.

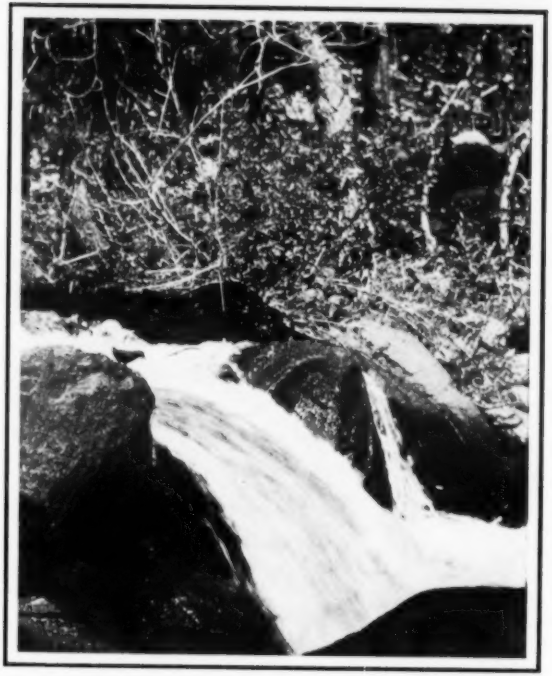
* With photographs by the author.

My efforts to beguile the excessively wary trout made me an object of much suspicion to a pair of these birds, who seemed to claim exclusive hunting rights on that part of the creek. Evidently they had never seen a man do so insane a thing as to whip a stream with a make-believe fly at the end of a long string. Was he fishing for ouzels? Did he expect their nestlings to bite on that fly? Their behavior made it apparent that a brood of nestlings must be hidden away behind one of the many cascades. It required but little observation to locate the nest—a moss-built affair sunk in the floor of a niche behind a heavy sheet of falling water. The site had been cleverly selected. No increase of volume in the stream could endanger the nest, for the pool had enough fall to spill all the water above a certain level. The diaphanous liquid curtain effectually screened it from observation and protected it from attack by bird enemies. Few carnivorous birds would venture to seek their prey behind a waterfall. The ready accessibility of this nesting-site for purposes of observation at once suggested to me the possibility of photographing the birds as they came and went in pursuance of their family duties. Their excessive shyness was the only obstacle. In order to overcome this I continued to fish for two days near their particular cascades, pretending not to see them; and yet it was only the occasional unwary trout that found his way into the creel. My interest for the time being was more ornithological than piscatorial. The ruse succeeded, for the ouzels decided that I was harmlessly interested in my own business, insane though it was, and began to go about theirs with confidence. This probation period afforded abundant opportunity for the study of their habits

and manners. My recollection of Mr. Muir's classic study added zest to my observations. What a winking, bowing, busy little creature the "dipper" is! In what far-off period of time did this "humming-bird of California waterfalls" acquire the bowing and scraping habit which one is accustomed to think the peculiar accomplishment of the snipe family and a few other water-birds? The possession of a nictitating membrane, which gives the bird an air of winking at the observer, is evidence of long and intimate acquaintance with the water. In his search after food he often lights in midstream on some rock over which the water dashes at intervals. Not infrequently I saw him swept off the rock into a churning pool. But his short wings enabled him to rise from the water with ease, or he swam complacently to the nearest bank and waded out. Several pair of them had set up housekeeping in more inaccessible places under some of the higher falls. As with short and rapid wing-stroke they darted in and out among the flying spume and spray, often directly through the swaying sheet of water, they seemed the very embodiment of the spirit of the waterfall. The two sprites which I had under particular observation were quite generous in showing off their varied accomplishments. They swam, dived, waded, sang; they pirouetted from rock to rock, slipped into the current by intention or accident, flickered in the sunlight, and washed their slate-colored plumage in the crystal water of the falls. Four hungry mouths kept them extremely busy. Every few minutes they appeared with their bills full of insects that live in and beside the water. In fact, a young water-ouzel seems to be quite as bottomless as a baby robin. Both continue in the begging habit as a fine art long



"HER LUBBERLY HUSBAND WAS STILL NURSING HIS SUSPICIONS ON A DISTANT ROCK IN THE STREAM."

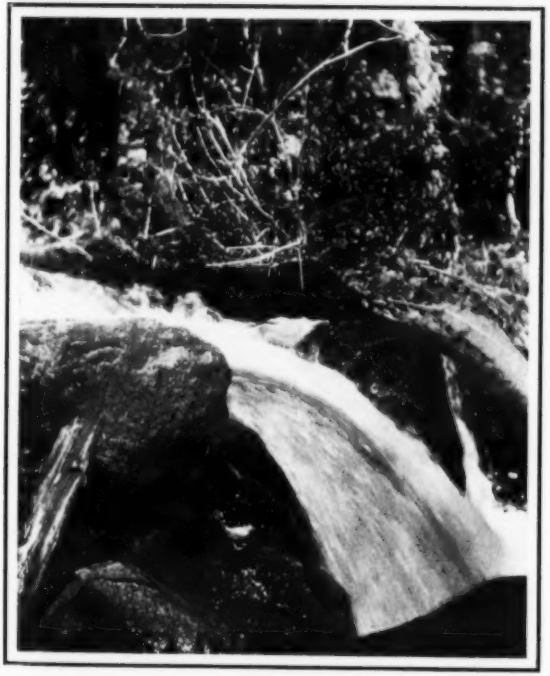


"WITH A MAY-FLY IN HIS BILL, READY TO DART BEHIND THE FALL."

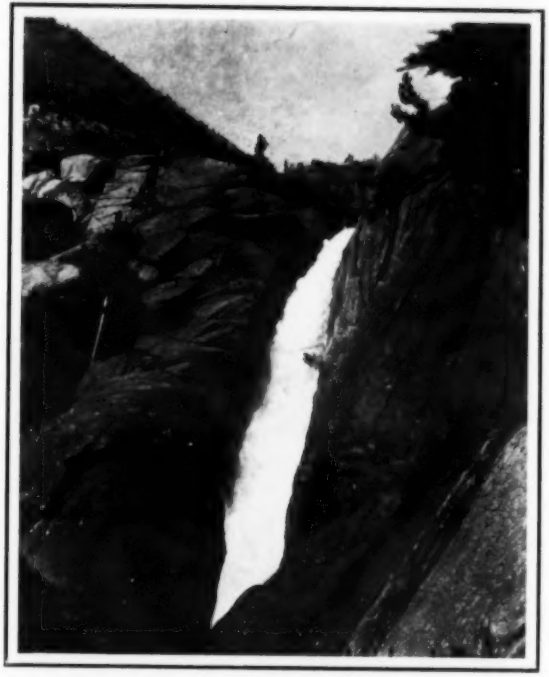
after they ought to be finding their own grub. Several young ouzels which I observed on Volcano Creek seemed the most accomplished avian beggars I have ever seen. Not only their voices but every sprouting pinfeather seemed to be saying, "Give a poor beggar something to eat!" Not the least interesting and commendable feature of a water-ouzel's family life is the fact that husband and wife expect to assume equal shares of the family burdens. How they apportion their duties during the period of incubation I was not able to observe. But both minister with equal assiduity to the needs of the fledglings. What is more important, they seem to hold each other to the performance of this duty under untoward circumstances. The following incident occurred at the time when I was preparing to photograph the birds at close range. I had concealed my camera within six feet of a place where they were accustomed to perch before entering the niche behind the cascade. Such close approach again excited suspicion and alarm. For considerably more than an hour they refused to carry food to their nestlings. Then the female began to reconnoiter. Seeing that I was apparently only whipping her home pool as I had whipped many another pool in the neighborhood, she decided to risk a visit to her nest with a load of tidbits. The distribution must have been made with unseemly haste, for she immediately appeared again through her doorway of spray. She was, however, in no haste to leave the neighborhood, but lit on a boulder a few feet away and warbled the equivalent of a "Coast clear" to her lubberly husband, who was still nursing his suspicions on a distant rock in the stream. (See Plate XIX.) He would not come. His bill was full of May-flies. A

second and a third time she signaled, and now he very circumspectly approached the cascade that hid the nest, flitting hesitatingly from rock to rock until he was almost beside her. But suddenly his fears again overcame his courage and he darted precipitately back to the place from which he had started. He was n't going to risk his neck, not he! This churlish behavior seemed to rouse the ire of his spouse. Instantly she lit beside him and running her bill several times vigorously into his fluffy plumage she took his catch of May-flies from him and carried them to the hungry nestlings. Her example no less than the little explosion of wifely indignation seemed to recall him to a sense of his duty. My presence was soon ignored, and he came and went as regularly as she. One of the accompanying photographs (Plate XIX) shows him with a May-fly in his bill, ready to dart behind the fall. His whole attitude—the uptilt of the stubby tail, the poise of the head and body—suggest something of the alertness that characterizes the water-ouzel at all times. The grace and swiftness of the mountain stream have passed into the bird's movements. The dash and music of its waters have sung themselves into his being. And there are moments, even in his busy life, when he likes to stand on a moss cushion and watch the stream glide by. (Plate XX.)

The little domestic episode described above, of course, does not embody anything that is peculiar in the water-ouzel's conception or performance of family duty. I have observed a disposition on the part of at least one other pair of birds to hold each other to a certain standard of domestic conduct. This occurred in the case of a pair of red-eyed vireos (*Vireo olivaceus*) who had built their nest in a flowering dogwood on the grounds of the Penn-



"HE LIKES TO STAND ON A MOSS CUSHION AND WATCH THE STREAM GLIDE BY."



WHERE THE WATER-OUZEL IS AT HOME.
(KERN-KAWEAH FALLS.)

sylvania Chautauqua, at Mount Gretna, Pa. From my second-story lecture-room I had them under daily observation during the entire period of incubation and until the fledglings were coaxed from the nest. As soon as the eggs had given place to five cavernous-mouthed nestlings, the work of foraging began. The diet of the young vireos consisted largely of caterpillars. The female always carefully minced hers during the first few days, but the male pushed the whole of his catch undivided down the throat of the luckless nestling that happened to be nearest to him. It was no thanks to his care that some of them narrowly escaped death by choking. Once the female happened to arrive just as he was about to repeat some of his bungling work. At once she flew at him with every sign of indignation, snatched the caterpillar from him and divided it piecemeal among her nestlings. For some time after that she contrived to be at the nest whenever he returned. Apparently she had no faith in his ability to feed her nestlings, for on these occasions she herself distributed the food he brought. Her actions, even as in the case of the ouzels, indicated that she *expected* and *disapproved* certain things in the conduct of her mate.

In the cases observed it was the female whose stronger maternal instincts made the demands on the conduct of the male. But the obligations and the demands are no doubt reciprocal. Such evidences of domesticity give the water-ouzel no mean place among birds that have an admittedly high emotional development. Long may this charming singer continue to dwell in the cascaded mountain fastnesses of the Pacific Coast—his only and inalienable home!

THE SAN FRANCISCO PEAKS IN APRIL.

By Edward T. Parsons.

There is a mountain fever that seizes the nature-lover, inspiring and moving him to seek the mountain-tops, there to delight in the magnificence and glory spread out for the contemplation of those who reach high pinnacles. In fact, the mere sight of a lofty snow-crowned peak is sufficient infection, and never do I gaze on one of those buttressed pillars of the temple of creation without a sudden access of this fever.

Those who have crossed the country on the Santa Fe route, and who, approaching the crest of the continent at Flagstaff, have gazed on the nobly symmetrical mountain group known as the San Francisco Peaks, will understand my feelings as I found myself at that place one Saturday early in April, 1901, with the long-awaited convenient opportunity before me to climb their loftiest summit.

My arrangements were soon completed, and at 4 o'clock in the afternoon I took a horse and buggy for the sixteen-mile drive to a ranch on the western slope of the mountain, where I was told meals could be procured. As the question of lodgings was a dubious one, I took my blanket-roll with me, finding afterwards that I was well advised in so doing.

Skirting the base of the mountain to the north of

Photo by E. T. Parsons.

THE SAN FRANCISCO PEAKS FROM THE WEST.

Photo by E. T. Parsons.

town, I followed a country road for a couple of hours through sections of Government land timbered with the Coconino pine, and alternate railroad sections that had been sold and all lumbered off. On the remaining timbered sections the snow still lay deeply heaped, and demonstrated the influence of forest preservation in the prolonging of the water supply for the agricultural territory lower down. However, the once-cleared sections had been mostly abandoned after the timber was removed, and since the declaration of the forest reservation had been free from destructive sheep-grazing. Here a vigorous growth of young pines promised well for the future.

Twelve miles out I overtook a large herd of cattle being driven by four Mormon cowboys. After a talk with them, and as I followed along, they, on learning my errand, invited me to join them at camp that night, which I did. It was easy to see that they thought it strange that any one should start out alone to climb a mountain, and they were somewhat suspicious lest I were a timber inspector or secret-service man looking up timber depredations or investigating illicit grazing on the reservation, but when reassured they were very cordial and hospitable.

At dusk we made camp near a little stream on the western flank of the mountain hard by the crude log-cabin at the ranch I was seeking, where the brother and sister of one of them were domiciled, waiting for their ranch to dry up for spring plowing. Before retiring I went up to this cabin and met the young woman and her brother. She insisted on my sharing their supper of bacon and eggs, bread, and coffee. She took pleasure in

explaining how she had roofed-in the lean-to with the tin of coal-oil cans and how she had put in the windows. She was about sixteen years old, but her hands were deeply calloused by hard toil, and she seemed to consider it a matter of course to do a man's work.

Returning to my blankets at the cowboys' camp-fire, I rolled up for the night. From the cozy comfort of my sleeping-bag I enjoyed a long and silent contemplation of the mountain in the bright starlight of that clear, vaporless atmosphere. Slumber overcame me as I listened to the murmur of the cowboys sitting about their fire telling tall stories of the ranch and preparing for their early breakfast. As the fire waned with the passing hours, the extreme cold of the early morning penetrated my covering and I woke to suffer and wait in chilly discomfort the slow-coming dawn. Ice froze one and a half inches thick in pools near our camp that night.

But after a steak with the cowboys and a cup of tea and bread and butter at the ranch, warmed by this double hospitality, I loaded up my camera, tripod, and binoculars, pocketed my luncheon of canned deviled ham, graham wafers, seeded raisins and prunes, slung on my canteen, and started for the mountain.

There was no trail, so I took my way across the ranch in the open meadows till I reached the first sparsely grown timber, which was the mountain aspen. The white trunks and symmetrical tops were very striking in the open landscape. Soon I reached the evergreens, and the occasional clumps of aspen contrasted charmingly with the dark-green foliage of the conifers.

That was a glorious morning. The clear, blue sky, the novel and beautiful landscape, and the pure ozone-

laden air invigorated me, and with every deep inspiration I drank in happiness and delight.

While thickly timbered for the most part, the way up the flank of the mountain was not impeded by underbrush, and traveling was easy. Approaching deep snow, I picked open spaces where the sun had solidified and hardened it, and so found good footing. I looked for deer and grouse, but saw none, and observed only the tracks of wild turkeys, which were evidently in goodly force about the mountain.

Nearing timber-line the trees were gnarled and stunted, mostly mountain pine and juniper. Traveling slowly, I began to feel some fatigue as I passed the last trees on the rocky spur I was surmounting. The broken rock of the open became more tedious and difficult and the rarity of the air oppressive, so that I proceeded short distances with frequent rests between, and at 10:30 took my first luncheon, on a large rock, from which I overlooked the wide-spread view to the westward. The dark green forests of Coconino County extended far as the eye could see, streaked with desert spaces and dotted here and there with hills and buttes. Mt. Bill Williams was the most prominent landmark, and he should have been a most worthy character to have had so noble a memorial. But I disliked to anticipate the pleasures awaiting me at the summit, so on I went slowly and more slowly, until at last, about 11:30, I stood on the mountain's crest, thirteen thousand feet above sea-level, on a finial point of the continental divide. Words fail me to describe the grandeur and magnificence of the outlook and the depth of my feelings, moved by the thrill of conquest and by the delight of the nature-lover in the sublime vista before me.

Seventy miles away to the northward extended the Grand Cañon of the Colorado. Looking down into it from the mountain-top, its farther wall, fifteen miles beyond its southern edge, showed plainly its immensity and austere grandeur. For nearly two hundred miles it extended in open view; while beyond it, away over in Utah, the Kainab Plateau, an immense mesa, limited the horizon.

Turning my binoculars to the eastward, the bright-colored earth of the Painted Desert lay before me, plainly marked by the course of the cañon of the Little Colorado River to its junction with the Grand Cañon and Marble Cañon. Nearer at hand was the brightly colored volcanic cone, Sunset Peak, with its cuplike crater, into which I looked from my high vantage-point. While close below me, embraced in the horns of the crescent-shaped mountain, extended a small steep-walled valley, in which lay the deep snows—source of many a distant stream and spring.

The nearer view to the southward was cut off by the ridge of the mountain which extended for about a mile, curving round to the eastward. Overlooking the ridge, away to the south, were many small lakes, which I saw for the first time, and which are not visible to the traveler on the railway.

Seventy miles to the southwest was the Verde Valley, on the further slope of which is the great mining town of Jerome, and I saw plainly the dense smoke from the roasting copper ores marking the location of Senator Clark's great smelter. I fancied I could distinguish the large hotel near the smelter, from the porch of which I had often gazed northward across the Verde Valley

and the mesa beyond to the snow-capped peak on which I was now standing.

Again I studied the outlook to the westward, noticing for the first time a volcanic cone near the base of the mountain, in the crater top of which was a little crystal-blue lake.

Seating myself in the sun on the east side of a large rock, sheltering me from the strong, cold wind, I enjoyed my remaining luncheon and looked out over the earth. Never before in all my mountaineering had I seen so wide an extent of the earth's surface and noted so varied and numerous examples of the working forces of Nature, volcanic action and erosion, with their evidences,—cones and lava-fields, great plains and deep cañons, timbered regions and desert wastes.

But the creeping shadows warned me of the flight of time, and prudence suggested the start for the descent. I set up my camera and made several exposures to the north and east, and then, seeking new experiences, I concluded not to retrace my steps, but to descend by a different route; so I made my way along the crest of the mountain for half a mile to the southward and started down the southwest spur of the mountain. At first all went well, but on reaching the snow-fields below the bare rock ridge, I found the surface softer and more difficult to traverse than on the route I climbed. For about a mile it lay from five to twenty-five feet deep. However, I made my way slowly but safely until, in an unthinking moment, I attempted a cross-cut through some thick timber where the sun, succeeded by frost, had not had opportunity to harden the surface, and soon I sank over head and ears in the soft snow. My heavy

camera and thick clothing impeded me; but finally, by dint of stretching out and wallowing at full length, and so laboriously working myself along, I succeeded in getting into the open again where the footing was more solid.

Swinging along below snow-line, across the opens and through the pines and aspens, I finally reached the cabin again at 5 P.M., tired and hungry. Supper cured the latter feeling, and, bidding my Mormon friends good-by, I was quickly on my way back to town, where I arrived at 9 o'clock, and was soon snug in bed, to rise next morning with an increased respect and appreciation for the noble mountain I had admired for so many years.

OVER HARRISON'S PASS WITH ANIMALS.

By Robert D. Pike.

The evening of July 3, 1901, found us near the head of that large flat, snowy amphitheater where heads the Kern. On the west of this amphitheater rise the lofty peaks of the Great Western Divide; to the north the pinnacles of the King's–Kern divide jut sharply out of long slopes of snow into the dark blue sky, and, contrasted with the glistening white, look dark and forbidding; on the east, rising above snow-slopes and rock terraces, are the great peaks of the Sierra Crest.

That day we had come from the meadows on Tyndall Creek, where for two days our seven animals—four horses and three donkeys—had been feeding on the short but nourishing high mountain grass, preparing, all unwittingly, for the ordeal through which they were to pass. We knew that they would be without feed for one night, but none of us foresaw the additional hardships that were to be their and our share. For the night we bivouacked on one of the occasional granite islands that raise themselves out of the sea of snow. Ours supported a few hardy alpine pines, which furnished good fuel, and quite a level space of decomposed granite sand, which made a comparatively soft bed. We picketed the animals near our camp, and throughout the night the poor beasts were restless with hunger and cold.

We awoke before daybreak the next morning and looked out on a frozen world. The thirteen shots which

Kobbe fired from his shot-gun to celebrate the Fourth rang out on the still, cold air with startling distinctness, and were reverberated in indignation from the surrounding cliffs. Everything was shrouded in the chill gray light of dawn, save where the higher peaks caught the light of the rising sun, and if it were not for the occasional chirp of an alpine bird perfect silence reigned. The cheerless aspect of things, the cold, and the poor hungry animals, huddled together for warmth in dejected attitudes, did not tend to raise our spirits.

We hurriedly prepared breakfast, and, packing up as quickly as possible, started at half-past 6. Our course lay over a gently sloping field of hard-frozen snow, which crunched with a substantial sound under the pressure of our feet. Two and a half hours steady climb up this slope brought us to the summit of the King's–Kern divide. We had chosen the depression between Crag Ericsson and Leland Stanford Peak, but the discouraging sight which met our eyes on reaching the summit made us doubt the wisdom of our choice. There at our feet fell off a precipice, impossible of descent even on foot. We were on the precipitous wall of a deep snow amphitheater, out of which flowed one of the branches of the King's River. The whole aspect took in steep bare cliffs, sawtooth ridges, and ragged peaks partly clothed in snow. Below us the greater part of the deep white basin reposed in the morning shadow, but tongues of light were gradually creeping in and dispelling the shadow along its western edge. The scene, to our eyes, seemed saturnine and forbidding, and we longed with the animals for fresh green meadows and shady trees.

Not much time was lost, however, in bemoaning our

plight. Immediately we started to search along the top of the ridge to the eastward, until, about a hundred yards from our position, we discovered a monument at the top of a very steep snow-chute leading to the bottom of the basin. It was so steep as to almost present the appearance of a cliff, and a snow-cornice at the top made a nearly vertical fall for about six feet. So this was Harrison's Pass! On looking down it we were strongly impressed with the fact that places called "passes" differ widely in character. But there was no alternative but to make our way down, because we could not go back.

Standing at the top, we threw rocks over the brink and watched them rush down with great leaps and bounds until they became dark specks on the still dull white of the bottom. Their hasty manner of descent warned us to be careful with our animals. The only possible way of getting them down was to cut a zigzag trail through the snow. This we began to do with our only tool, a small ax. It was weary work. One of us would chop out blocks of snow with the ax and push them over, while another would follow behind and tramp down the newly made trail. About fifteen feet of trail was all one man could do at a time. He would then be relieved by the one behind and rest until each man had had his turn. For about twenty feet along the first leg of the trail the wall caused by chopping out was about five feet high. Further down, however, the slope was less abrupt. Each leg of the trail entirely crossed the gully and found a turning-place on the rocks, where in one case, at the first turn, some ice was encountered, making it a dangerous spot for the animals. We kept up this chopping until the morning shade had given place to the burning glare of

midday, when we lunched on cold mush and prunes and then worked again till the cool shade of late afternoon overtook us. At this time a considerable stretch of snow still remained, but it looked as though the animals could get down over it.

After a few minutes' rest, spent in gazing up the steep white slope half-covered by a jagged-edged shadow, whose edge ran up the middle of the pass, lined by our trail, flanked by jagged brown granite pinnacles, and crowned by the dark blue alpine sky, we started the hard job of dragging and carrying our goods to the bottom, for the animals would have all they could do to manage themselves. The kyaks we dragged along the trail, because it was easier than carrying them, and it helped to pack the now softened snow. Our clothes-bags we tied up tightly and rolled over the top. Immediately, charmed by gravity, they seemed to become animate, and with great leaps sped along until they reached the level and were ordinary clothes-bags again. This work necessitated each man going up and down the pass—a vertical distance of about seven hundred feet—three times, which well-nigh exhausted us all.

With our outfit packed safely on the rocks at the bottom, we turned our attention to the last and most difficult undertaking. All day long our minds had looked forward in nervous apprehension to taking the animals down the trail. The events of the day had not made us optimistic, and with our bones aching and our skins burning we looked for the worst. On reaching the top we saw the poor horses with their heads hung low and their ears in noncommittal attitudes, the very pictures of dejection. Our hearts went out to them, for we knew they

would have another night without feed. Two of the donkeys, however, "Johnny" and "Jumbo," little beasts with much worldly wisdom in their heads, stood with a look of evil contentment in their eyes. They slowly munched their jaws, and yellow bits falling from their mouths, together with yellow blotches on their noses and on the snow, and a torn corn-meal bag, showed us the nature and extent of their theft. A short way from them, and not so fortunate in breaking loose, stood "Pete," our third donkey, tugging at his rope with watering mouth and ears bent forward in a piteously expectant attitude. This corn meal we had neglected to bring down; so we took the blame for its loss on ourselves.

After this funny little incident we started to lead the animals down the trail. Three of us led off, each leading a horse; and the three donkeys were driven behind us by Halloran, who led the fourth horse. The horses occasionally plunged belly-deep in the soft snow, but always managed to lunge out and keep on the trail. Their efforts to free themselves from the snow were sometimes so violent that we had to give them a long rope to prevent being trodden upon. On coming to the end of the trail we turned the horses loose, expecting that they could go down the remaining slope easily. But each one of them rolled head over tail for about a hundred yards, and then, gradually picking themselves up, stood around as though nothing unusual had happened. They were too exhausted to even be nervous. On this last stretch the donkeys fared better than the horses, owing to the inborn stubbornness in their natures as well as to their cool-headedness. They sat on their haunches and, ears bent forward intensely and fore-feet propped well out in front

of them, felt their way down with infinite caution, and no detriment to their dignity. It was a comical sight to see them move along so slowly and seriously, sitting on their haunches, and it looked as though they were balking against gravity.

When "Johnny" reached the bottom, and was proceeding along in a careless manner, he suddenly fell into a deep snow-hole. He must have stayed there for some minutes before we missed him, for on looking around, when about to put on his pack, we espied his nose, ears, and pack-saddle just above the snow. We realized that he must be uncomfortable and hastened to pry him out, which process was effected by grabbing his nose and tail and then his middle and lifting him out. When free from his bondage he walked over to be packed unconcernedly, —plucky little brute that he was,—for he must have been almost frozen to death. All of the animals, maybe without appreciating it mentally, displayed a lot of grit, for none of them balked once through the day.

Now followed as trying an experience as any that had preceded. It was now 5 o'clock, but we still entertained the vain hope of reaching feed that night. The floor of the basin over which we now proceeded was a wicked mixture of rocks and snow, absolutely the worst obstacle that Nature puts in the way of animals in these parts.

There was no way of continually keeping to the snow, and, in passing from the snow to the rocks, the animals would lunge into the caves which always occur at the juncture of rocks and snow. In doing this they gashed their legs frightfully, and only escaped cutting an artery or breaking a leg by a miracle. On one occasion my horse's hindquarters broke through the crust with such

"THE VERY PICTURES OF DEJECTION."

"'JOHNNY' SUDDENLY FELL INTO A DEEP SNOW-HOLE."

violence that the whole pack, saddle and all, went off backwards.

We kept up this hard, slow traveling until night found us on a barren, snow-bound rock island, without a vestige of vegetation. Neither timber nor feed was in sight, and the prospect for the night was miserable for man as well as beast. We turned the animals loose after unpacking them, and, as there was no fuel, went to bed on the smoothest places procurable, taking with us the few dried prunes which we ironically called dinner.

That night was one of sound dreamless slumber despite the rocks and our burning skins. The next morning, when the rest of us awoke, Fairbanks had been down to timber-line for fuel, and the result of his labor was a bright fire, which cast flickering shadows on the still dark rocks and snow. Over this small fire we cooked some hot breakfast and felt much better for it. The effect of a fire and a hot cup of coffee in a cold, dreary place like this is to raise one's spirits immensely. There could not be much joviality in camp that morning, however, for the glare of the snow during the previous day had rendered Kobbe and Halloran snow-blind, and they were suffering much agony from it. During that day and part of the next they could scarcely see, but then the soothing effect of green meadows, and the deep shadows of the trees, and a sky which did not seem like night in comparison with the earth cured them, and their eyes were none the worse for their scorching.

As soon as possible that morning we got the animals down to a little meadow, where we stopped to let all hands recuperate, and talk for a while, in no complimentary way, of Harrison's Pass.

THE ASCENT OF SAN ANTONIO.

By Willoughby Rodman.

The highest mountains of Southern California are Grayback (also known as San Bernardino) and San Gorgonio. These two peaks rise from a common base, and, with that uncertainty which characterizes the nomenclature of this section, the three names given are applied to them indiscriminately.

The higher of these peaks attains an altitude of more than 12,000 feet, and is said to rise higher above the level land immediately surrounding it than any mountain in the world.

To the southeast rises Mt. San Jacinto, an extinct volcano, whose rumblings even to-day cause the Indians to speak of it as the abode of evil spirits. This mountain is said to have the highest vertical rock wall of any mountain in the world.*

But the best-known mountain, the real king of the Sierra Madre Range, is San Antonio, erroneously (and lovingly) called "Old Baldy."

Situated near the center of the complicated system of cañons and ranges comprising the Sierra Madre Range, towering far above its neighbors, "Old Baldy" is the dominant feature of the landscape. It is the first prominent mountain to greet the traveler from the north or

* What Southern California lacks in altitude of its mountains is made up by he altitude of its lies.

SHOWING THE ROUND HEAD OF "OLD BALDY" AT THE HEAD OF SAN ANTONIO CAÑON.
Photo by Mr. G. R. Roundhwaite. Courtesy of U. S. Weather Bureau.

GENERAL VIEW OF THE CUCAMONGA MOUNTAINS, LOOKING TOWARD NORTH-NORTHEAST.
SHOWING THE ROUND HEAD OF "OLD BALDY" AT THE HEAD OF SAN ANTONIO CAÑON.
Photo by Mr. G. R. Rounthwaite. Courtesy of U. S. Weather Bureau.

east, and is the most prominent object to the dwellers in the San Gabriel Valley.

It deserves its pet name, for age-long battle with the winds from every quarter has completely denuded of vegetation its hoary summit. For about half the year a cap of snow adorns the crest, while at other times the white rock of which the peaks are composed produces a similar effect.

This mountain is situated near the easterly boundary of Los Angeles County, about fifty miles northeasterly from Los Angeles, and is the culminating point of the second range of the Sierra Madre Mountains, which extend in three parallel ranges between the ocean and the Mojave Desert.

The altitude of San Antonio is not accurately known. Measurements by the county surveyor of Los Angeles County show an altitude of 10,890 feet. The United States Coast and Geodetic Survey record is 10,100 feet, which is probably more nearly correct.

It is visited by a number of persons every year, as the ascent presents no great difficulties, being practicable, on the south and west sides at least, for saddle-animals. The greater number of visitors ascend from the San Gabriel Cañon, returning by the same route, as this is the easiest, though longest, of the approaches. The ascent by the west or south side is perfectly safe, though laborious. The ascent from the north presents some danger.

The writer had the pleasure of making the trip in November, 1903, spending two most enjoyable days en route. The party was composed of six members of the Sierra Club,—Messrs. Force Parker, Clair Tappan, R. B. Dickinson, Ross T. Hickcox, Thornton Kinney, and the

writer,—all of whom, except Mr. Tappan, took part in the Kern River outing. Taking the Santa Fe train leaving Los Angeles at 7:30 on the morning of November 7th, we arrived at Uplands, where we left the railway, at four minutes after 9.

From Uplands a ride on a trolley-car soon brought us to the limit of passenger travel, but we begged a ride on a construction-car to the end of the line. Here we were joined by Dr. and Mrs. F. J. Dawson, of Uplands, who were to accompany us to our camping-ground. Our burros were awaiting us, packing was soon completed, and our tramp began. It was a genuine delight to be once more in Sierra Club "uniform," with our faces turned towards the mountains.

We had selected the San Antonio Cañon route, as it requires the least time. The trail through the San Gabriel Cañon passes through grander scenery, and is in most respects more attractive, but it requires several days, and our time was limited.

San Antonio Cañon is entered by a road which passes over a broad mesa, the road dipping considerably as it crosses the spur which forms the cañon's eastern wall. For about eight miles we followed a broad, well-made wagon road, and in consequence did not feel comfortable. Three of us varied the monotony by taking a wrong road and climbing an intervening ridge to regain the path. At the power-house of the Sierra Power Company we paused to inspect the machinery as well as some large trout, the sight of which caused delicious thrills. Ten minutes more on the road, then a sharp pull took us over the "hog-back," a steep rocky ridge which deserves its name.

Soon after this, leaving the road, we continued along the floor of San Antonio Cañon about two and one half miles; then, making a sharp turn, entered Bear Cañon, where a steep, narrow trail made us begin to feel at home. For a short distance the trail follows a brook, and is embowered by overarching trees. Then, leaving the cañon, winding along a mountain-side, a steady climb of about one mile took us out of the timber and brought us to Fern Flats, our camping-place.

It would be difficult to imagine a more dreary or unattractive camping-place than Fern Flats. Bullion Flat at its worst must yield to it. The only reason for its use is, that it is the last place where water can be obtained. It has nothing else to recommend or justify it. Beyond the timber-belt, though below the timber-line, situated near the head of a broad cañon, it is swept by a bitter wind. Fuel is scarce and must be carried some distance. There is not sufficient level ground for sleeping-places, and altogether a prospect is presented which would daunt all but true mountain-lovers. But as all true "High Sierrans" are genuine mountain-lovers, we did not growl overmuch, but proceeded to make the best of it.

First came wood-gathering—long hauls and small profits. But a bright fire and the prospect of an abundant supper eased all our cares, and soon we were partaking of a meal which did not require the keen air of the mountains to make most enjoyable. Mrs. Dawson came to our assistance with some of that automatic (?) buckwheat flour which requires only a suggestion to transform itself into cakes, and which, with maple syrup, was to our meal "like the benediction that follows after

prayer." After a perfunctory and not too thorough dish-washing, fresh logs were piled on the fire, pipes were lighted, and we entered into the domain of the blessed.

(Here, at the suggestion of the editors, I omit ten pages on the joys of camp-fires.)

But I must mention one circumstance. By that camp-fire in a windy cañon of the Sierra Madre the Southern California Section of the Sierra Club was born. An organization was completed and work planned. The object of the section is to forward the work of the Sierra Club in Southern California. It is strictly subordinate to the parent club (Sierra Madre?). It will take no action not sanctioned by the directors, and will always work in the name of the club, and for the purpose of extending its influence and furthering its objects.

I shall not at this time trouble the readers of the BULLETIN with an account of the work performed by the section since its organization, but state that we hope in the future to accomplish even more.

At about 11 o'clock we began to crawl into our sleeping-bags. As the night was bitterly cold, some left the fire with regret, and some did not leave it at all, dragging their beds into the very ashes. It seemed to the writer that the temperature was even lower than we found it on the Mt. Whitney trip in July, 1903. During the night water in a cooking utensil froze to the thickness of three quarters of an inch; and a thick frost accumulated on the rubber case of one sleeping-bag.

Breakfast was rather cheerless, on account of the cold, but we prepared to start in good spirits.

At Fern Flats the real climbing begins. The trail from there on is narrow, though distinct and well worn.

For some distance it zigzags up the wall of the cañon, coming out upon the southeast side of San Antonio, among large though scattered pines.

Following the edge of the cañon about half a mile, the trail reaches one of those very long, sharp ridges which form the approaches to the summit. The climbing was steep, but the view more than compensated for our labors.

Our trail followed the edge of the magnificent precipice which forms the mountain's southwest side. In many places the fall is sheer for nearly two thousand feet, and at all places it is precipitous. The granite has become disintegrated, and the cliffs and "slides" are almost snow-white. Stones sent rolling down raise a cloud of white dust. The effect of these white walls and slides is peculiar and striking. Many seeing the mountain for the first time, think its sides are clothed with perpetual snow.

Several of these long ridges, converging, form the summit. These ridges are covered with stunted pines. Near the summit these trees present very curious phenomena. The wind is so strong and blows so persistently as to materially affect their growth. A tree of nearly three feet in diameter will at a distance of about thirty inches above the ground be so bent over as to grow almost parallel with the mountain-side. On the side exposed to the prevailing wind, and on the opposite side, branches are entirely wanting, and those growing on the other sides are generally short and stunted. On a few trees are observed rather long branches which, projecting over the ground, produced the effect of a wide-spreading bush.

Leaving the edge of the south slope, the trail follows

a saddle for about a quarter of a mile, then follows another ridge for a short distance, dipping below its edge. It would be well-nigh impossible to keep to the backbone of the ridge at this place, as the wind sweeps across it with enormous velocity. Except a few small pines, there is no vegetation. The footing is composed of small, loose stones, so hard and so moved about by the wind that in places there is not even a trace of the trail. But there is no danger of straying, as the summit is in sight. For the last half-mile the climb is exceedingly laborious. The ascent is gradual, and the footing sure, but the force of the wind necessitates a constant struggle, sometimes a full stop. Often small quartz pebbles were blown into our faces with great velocity, having the imagined force of a charge of bird-shot. The wind seemed to increase as the summit was approached.

Reaching the top, the writer found Messrs. Parker and Tappan crouched shivering behind the monument of the Coast and Geodetic Survey, and was glad to crawl under their friendly gray blanket. It was only under shelter that one could breathe in comfort. The velocity of the wind we estimated at forty miles an hour.

The view from the summit is grand. It is entirely different from the prospects from the peaks of the Sierra Nevada. There is no circle of snow-capped granite peaks such as makes the view from Brewer or Williamson so wonderful. The eye is not charmed by an apparently endless succession of sierras and peaks, nor by the courses of great cañons. But the view may well be called magnificent, and would repay exertion however violent or hardship however great. San Bernardino (Grayback) and San Gorgonio loom above us. To the south lies the

ever beautiful San Gabriel Valley, while westward is the intricate maze of the San Gabriel Cañon. From San Antonio to Mt. Wilson, in the first range, the distance is about twenty miles. Between is the enormous basin drained by the San Gabriel River. This watershed is marked in all directions by a perfect tangle of cañons.

Many of these cañons pass between precipitous walls of great height, and their scenery would prove attractive even to those accustomed to the great cañons of the Sierra Nevada. Many small mountains rise from the basin, but none sufficiently high to obstruct the view. Mts. Wilson, Lowe, and San Gabriel are prominent points of the first range.

Unfortunately, our view was obstructed by clouds and by a thick haze of smoke and dust. On clear days it is possible to obtain views of the Colorado River as far south as Yuma. To the southwest San Diego is visible, while the coast can be traced for a long distance. The islands of San Clemente and Santa Catalina can be distinctly seen, with a great expanse of ocean. To the south and east lie vast stretches of the Mojave and Colorado deserts. It is said that Mt. Whitney is visible, but clouds rendered it impossible for us to determine this matter. Our disappointment was somewhat mitigated by the consideration that, even had the view not been obscured, we could not have fully enjoyed it, on account of the wind, which not only rendered a standing position extremely difficult to maintain, but caused such a flow of tears as to interfere with vision.

Back of the Coast Survey monument some person had made in the loose rock a gravelike excavation about a foot deep, and had constructed along one side a stone

breastwork about a foot high. Whether he was prospecting for gold or for a quiet grave I do not know, but I used it as a protected observatory. Lying in the pit, I managed, by peeping through the interstices of the stones, or over its edge, protecting my face with my hands, to obtain several views. Before me was a wide stretch of desert, orange yellow, with dashes of *ecru* and long streaks of gray or white. Directly in front wound the sinuous defile of the Cajon Pass. To the right the enormous mass of the San Bernardino Mountains bulked the horizon, while beyond towered in solitary majesty the beautiful peak of San Jacinto. Although the view was what might be called "fitful," the prospect was magnificent and inspiring. Each of us felt fully repaid for his exertions, and would willingly repeat them for the same reward.

Soon we were assembled, and, as the cold and wind made a long stay impossible, took a hasty luncheon and prepared to descend. We had sent our burros back to the valley, so our downward climb was a knapsack trip. We did not retrace our steps, but followed the easterly ridge, descending into the cañon of Lytle Creek. The first mile of the descent might be called dangerous; and one of weak nerves would find it really appalling. The ridge is very narrow, almost a knife-edge. On one side there is a sheer fall of many hundred feet; on the other the descent is so abrupt that one falling could not recover himself. There is no trail. All there is to do is to keep as close to the edge as one dares. The edge is horizontally serrated,—that is, deeply indented. Those who climbed Mt. Whitney will remember the appearance of its eastern side. The northerly side of San Antonio presents the

same features, but the indentations are more numerous and not so deep. It was necessary to keep a sharp lookout to avoid stepping into one of these indentations. The wind-gods, evidently resenting our intrusion upon their domain, and wishing to make our departure as unpleasant as possible, made one last furious assault, almost taking us from our feet. Walking that narrow ridge in the face of such a wind was no easy task. We have heard of people who crawled along the ridge, but we managed to keep our feet.

We kept close to the edge of the ridge for more than a mile, then turned away near the abandoned works of the Agamemnon Mine. For several miles we followed the wagon-road made to be used in connection with the mine, but now abandoned. Soon after it reaches the bed of a small cañon, the road is entirely washed away for some distance, the only footing being loose stones.

Pausing near a stream for the last meal of our outing, we built a rousing camp-fire and attacked our "remnants" with vigor and zest.

We had first thought to cross the ridge which separates Lytle Creek Cañon from the Cajon Pass, spend several hours on the platform of a mountain station, and take a Santa Fe train passing at about 5 o'clock in the morning. But the prospect of sitting on cold, hard planks four or five hours was not alluring, so it was determined to push on to Glen Ranch, which we did, arriving there at 11 o'clock at night, sixteen miles from the summit, twenty-two from our morning camp. Of course, every true mountaineer prefers sleeping on the ground to everything else; but after our tramp we managed to reconcile ourselves to the comfortable beds of Glen

Ranch. Then at 5 in the morning came a sixteen-mile drive to Rialto; the railway; Los Angeles at three minutes after 10; and the end of our outing.

It was not a long jaunt. We met with no adventures, accomplished nothing noteworthy, and our objective point was not one of the grander mountains of the world. But the trip will always be remembered by those who made it. The little taste of camp life, the genuine good-fellowship, and the inspiration of the mountains, made our fifty-hour outing an experience to be remembered with the greatest pleasure.

The trip is one which recommends itself to every member of the Sierra Club. It is thoroughly enjoyable, and more than repays the necessary exertion. It is hoped that many club members will make this trip. And they will please remember that the Southern California Section is entirely at their service.

SIERRA CLUB BULLETIN.

PUBLISHED IN JANUARY AND JUNE OF EACH YEAR.

Published for Members. Annual Dues, $3.00.

The purposes of the Club are:—"To explore, enjoy, and render accessible the mountain regions of the Pacific Coast; to publish authentic information concerning them; to enlist the support and co-operation of the people and the Government in preserving the forests and other natural features of the Sierra Nevada Mountains."

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SECRETARY'S REPORT.

FROM MAY 9, 1903, TO MAY 7, 1904.

At the annual election in April the Directors named on the preceding page were elected to the Board to serve for the year 1904-1905. The officers there named were elected at the first meeting of the new Board.

There were one hundred and ninety-nine new members added to the list during the year, while ninety-eight names were dropped from the list by reason of death, resignation, or non-payment of dues, making a net increase of one hundred and one members for the year. The total membership now numbers seven hundred and sixty-four.

There were certain unusual expenditures during the past year, such as the outlay of one hundred and fifty dollars in the improvement of the Tehipite Trail, the payment of one hundred dollars necessary to complete the Le Conte Memorial Fund, the purchase of Professor Lawson's Geological Bulletin on the Kern Cañon for each member of the Club (which was kindly furnished at actual cost of paper and presswork), also the additional outlay connected with the exchange of publications with the Appalachian Mountain Club, and the increased expense of rent of the club-room in the Mills Building, and the extra cost of the two issues of the BULLETIN which appeared during the year, and which were both of larger size than usual. In spite of all this additional outlay the finances of the Club are in as good condition

as ever, and there remains a balance of about six hundred dollars in the treasury after every bill has been paid.

The Le Conte Memorial Lodge in Yosemite Valley has been opened for the summer as a Club headquarters where persons may obtain information regarding the high mountains and how to reach them, and where maps, photographs, and books belonging to the Club can be consulted. As has been the custom in the past, a custodian or caretaker has been selected to take charge of the Lodge during the three months of heaviest travel to Yosemite. Mr. R. L. McWilliams, a recent graduate of the University of California, has been chosen to fill this position, and is in every way qualified to represent the Club.

The Lodge will be formally dedicated on the 3d of July, when the Outing party will have reached the Valley, and thus a large attendance of members of the Club will be rendered possible. The services will be very simple in their nature, and will thus be in entire keeping with the simplicity which characterized Professor Le Conte's life. There will be addresses by those who knew him intimately, a poem written by one of the members will be read, and a bronze tablet, with appropriate inscription indicating the purpose for which the building was erected, will be permanently inserted in one of its walls.

The Outing for this summer will be taken through Yosemite to the Tuolumne Meadows, where a permanent camp of two weeks will be established, and from which place the party will return through Hetch-Hetchy Valley and by way of Lakes Vernon, Laurel, and Eleanor to the Hetch-Hetchy and Yosemite valleys' logging-train, which connects with the main-line railroads. Limiting the

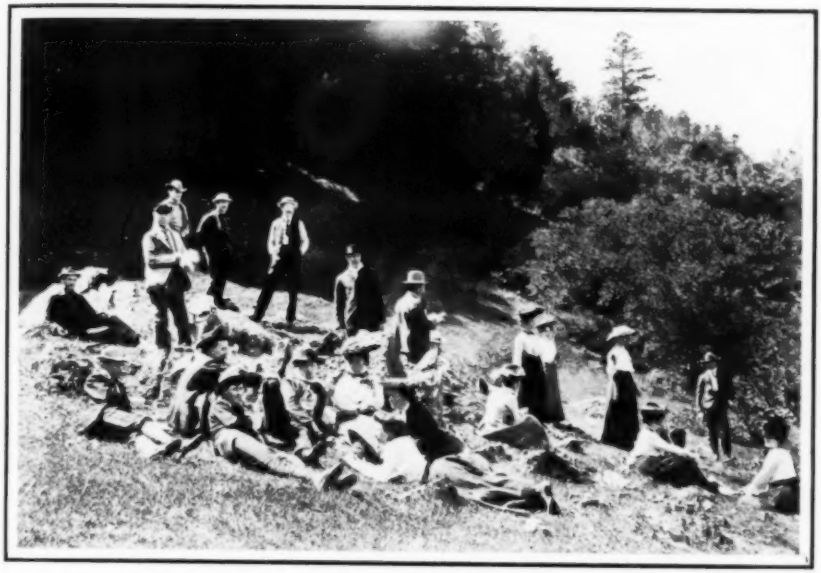
party to a number that can be conveniently and satisfactorily handled and provided for will doubtless make this year's Outing the most successful that has been undertaken.

The local walks that have been recently inaugurated by the Club have proved to be a great success, and will tend to build up and strengthen that phase of the Club's life. Seven all-day walks have already been taken to points of interest in Marin and Alameda counties, and have had an average attendance of twenty-five persons. The excursion to Mt. Diablo, taken May 28-30th, proved to be most delightful. Twenty-eight members of the Club spent the night of the 29th on the very summit of the mountain and witnessed a most glorious sunset and sunrise, and were also fortunate in having a full moon to add to the rare scenic effects. Since Admission Day, September 9th, will fall on a Friday this year, it is proposed to take a three-days' excursion, September 9-11th, to the Big Basin Redwoods in Santa Cruz County this fall. The local walks will be discontinued after the middle of June until September 9th, on account of the High Sierra Outing and the vacation period which will intervene.

It is proposed to have a Club pin, which can be made of either oxidized silver or gold from a die which will be a copy of the Club seal, only much reduced in size. Since the price of such pin can be greatly reduced if a sufficient number apply for the same, it is requested that any member who contemplates purchasing one, provided the cost of the same in silver does not exceed one dollar, send his name to the Secretary.

Respectfully submitted,

WM. E. COLBY,
Secretary of the Sierra Club.



HEAD OF CATARACT GULCH.
(LUNCH-PLACE ON FIRST SIERRA CLUB WALK.)

AMONG THE REDWOODS OF SEQUOIA CAÑON.
(ON THE WAY HOME FROM THE FIRST SIERRA CLUB WALK.)

Photos by Antoine Schmitt.

TREASURER'S REPORT.

Owing to the absence of the Treasurer, Mr. J. N. Le Conte, who is at present in the East, the Treasurer's report for the year 1903-1904 will be postponed until the January, 1905, issue of the BULLETIN.—EDITOR.

NOTES AND CORRESPONDENCE.

In addition to longer articles suitable for the body of the magazine, the editor would be glad to receive brief memoranda of all noteworthy trips or explorations, together with brief comment and suggestion on any topics of general interest to the Club. Descriptive or narrative articles, or notes concerning the animals, birds, forests, trails, geology, botany, etc., of the mountains, will be acceptable.

The office of the Sierra Club is at Room 16, Third Floor, Mills Building, San Francisco, where all the maps, photographs, and other records of the Club are kept, and where members are welcome at any time.

The Club would like to purchase additional copies of those numbers of the SIERRA CLUB BULLETIN *which are noted on the back of the cover of this number as being out of print, and we hope any member having extra copies will send them to the Secretary.*

Owing to the fact that the Editor, Mr. J. S. Hutchinson, was called to Alaska on business, and that Professor and Mrs. J. N. Le Conte are in the East, the labors of editing this issue of the BULLETIN devolved upon the Secretary of the Club. Any errors and shortcomings in the editing are due to the lack of time and many difficulties which confronted the Secretary in undertaking the work on such short notice.

APPALACHIAN MOUNTAIN CLUB,
1050 TREMONT BUILDING, BOSTON, May 10, 1904.

TO THE EXCURSION COMMITTEE OF THE SIERRA CLUB,
SAN FRANCISCO, CAL.

Greeting: The Committee on Field Meetings and Excursions of the Appalachian Mountain Club extends, through you, to the members of the Sierra Club, the courtesies of the Committee and a cordial invitation to participate in the Field Meetings, Excursions and Outings of the Appalachian Mountain Club for the season of 1904, upon the same terms and with the same privileges as enjoyed by the members of the Appalachian Mountain Club.

For the Committee on Field Meetings and Excursions,
GEO. W. TAYLOR, *Chairman.*

LONE PINE, INYO CO., CAL., May 17, '04.

PROFESSOR MCADIE, SAN FRANCISCO.

Dear Sir—Your letter safe the other day. Thank you for your help. I shall look forward to the time when I hear from

you again. I am very glad to say we have started our subscription to finish the Mount Whitney Trail, and I am glad to say we are getting along very well, but I am afraid we shall need outside help. Independence has promised me $100, and Keeler will help a little, and I think Mr. B. P. Oliver, of 114 Montgomery St., S. F., will help, and his friends. I shall be very glad of your help in speaking to any of your friends interested in the mountains. Perhaps you may induce some of the Sierra Club to help us. Most of the people are poor, and many have offered to work instead of giving money, but we need some money for powder, food, and pack-animals. Last year we borrowed all the tools and cooking outfit. I hope you will try and help us, if it is only a few dollars.

We hope to have the trail completed by the 4th of July, but it depends on the money and the snow, but the snow is very light and soft. We have had some very warm weather lately, and the water from the mountains is coming very fast—much earlier than last year. I am in charge of finishing of the trail, and I am very anxious to get at it. Trusting you will do all you can for us, and some day we may be able to repay you,

Yours truly, G. F. MARSH.

[If any member of the Club desires to subscribe to this fund for completing the trail from Lone Pine to the summit of Mt. Whitney, such subscription forwarded to the Secretary of the Club will be sent to those in charge of the work.—EDITOR.]

STANFORD UNIVERSITY, CAL., April 8, 1904.

MR. WILLIAM E. COLBY, SECRETARY OF THE SIERRA CLUB.

Dear Mr. Colby—I take the liberty of calling your notice to a subject which seems to me to merit emphatic attention from the Sierra Club, and one which might well receive mention before the members at the Saturday meeting. This is the nomenclature of features in the California mountains.

In the first place, and specifically: the Sierra Club should this summer permanently fix the original Indian names, which are so exquisitely appropriate, on the three most striking wonders of the Hetch-Hetchy Valley,—the shower, *Tuccoolala;* the cataract, *Wapama;* and the rock, *Kolana.* (John Muir, California Series 7, Picturesque California.) These have been dubbed in a commonplace fashion by mappers and tourists,—the first "Ribbon Fall" or "The Hetch-Hetchy Bridal Veil," and the second "Hetch-Hetchy Fall,"—or have been left unnamed, while their true, primitive christenings have remained quite in oblivion. "Falls Creek" likewise is an applicant for emendation, and "Mt. Smith," on the crest of the cañon-wall just south of the

cascade between the Little Hetch-Hetchy and the Tuolumne Cañon, is obviously a disreputable misnomer, and could easily be altered without the least prejudice to the aspiring scion of the legion of Smiths.

Secondly, and more generally: there are grand natural features throughout the Sierra Nevada, either doubtfully, disgracefully, or doubly named that offer opportunity for the accomplishment of great good by such an organization as the Sierra Club in return for the simple application of a little interested, slightly authoritative attention, now while the range is yet young to the civilized world. As other examples, might be taken Whitney's "Obelisk" in the Merced Group, which assumes priority, I think, over the name "Mt. Clark," now in common vogue,—perhaps too much so for betterment,—and the Indian synonyms for Yosemite points of interest. (Whitney, Geological Survey of California, 1865; and the Yosemite Guide-Book, 1869.)

Why should not the Sierra Club have a committee to investigate such matters, to discover priority in the naming,—or, if need be, as Mr. Gannett has suggested, overlook such priority,—and in general to decide questions of fitness in the application of place names? Such a committee as an organ of the Sierra Club would serve a purpose in this State similar to that of the U. S. Board on Geographic Names, with perhaps a little more legislative in addition to its judicial power, and thus bring man's only addition to Nature's work more in harmony with the refined and sturdy beauty of our "Range of Light."

Please pardon me if my enthusiasm has led me into a discussion which may have already received full consideration from the officers and members of the Sierra Club, and believe me,

Very sincerely your friend, ROBERT ANDERSON.

[The Directors of the Club have some months since appointed a Committee on Names whose duty it is to investigate and act on just such matters as the writer of the foregoing letter has called to our attention. Unfortunately, it is more difficult to change names in the region mentioned by the writer since the geological surveys have already covered that region, but in the Southern Sierra, in the vicinity of the King's River, where the surveys are now being extended, there is greater prospect of doing some good.—EDITOR.]

1001 JACKSON ST., OAKLAND, CAL., May 29, 1904.

To Mr. WM. E. COLBY, SAN FRANCISCO, CAL.

Dear Sir—Permit me to call your attention to the recent loss sustained by Mr. Fiske, the world-renowned photographer of

Yosemite Valley. In the fire that consumed his home and studio Mr. Fiske lost two cameras and lenses worth $600, three quarters of his negatives, and a large part of his stock.

Mr. Fiske is a most superior artist; his beautiful pictures have told the story of Yosemite's grandeur throughout the civilized world.

Mr. Fiske has spent over twenty-five years in Yosemite; he is seventy-five years old; at his age the loss is very discouraging. His pressing need is "to get new cameras, outfit, and supplies to work with."

Mr. Vickery was good enough to suggest that possibly the Sierra Club might assist in replacing the cameras.

If your Honorable Club should take a favorable view of this matter, will you kindly send the check to Geo. Fiske, Yosemite, Cal., and oblige Very respectfully yours,

(Miss) F. M. HALL.

[The above communication was received too late to bring before a Directors' meeting, and on account of the absence of several of the Directors a meeting cannot be called until after the summer vacation. Any one interested can send any contribution to Mr. Fiske direct as suggested above.—EDITOR.]

1412 SPRUCE STREET, PHILADELPHIA, PA., April 19, 1904.

J. S. HUTCHINSON, JR., ESQ.

My Dear Sir—A note in the SIERRA CLUB BULLETIN (vol. V, No. 1, pp. 78, 79) refers to the highest mountain ascents. May I call your attention to a short article I published in the Bulletin American Geographical Society, New York, January, 1904, discussing the highest mountain ascent, which all the evidence shows was made by Mr. W. W. Graham? I think he ought to have the credit therefor. Yours very truly,

EDWIN S. BALCH.

[We have examined the Bulletin American Geographical Society, New York, January, 1904, and do not find the article referred to above. Instead we find the following note on page 51: "In the *Scottish Geographical Magazine* for January there is a summary of recent mountain climbing in the northwestern Himalayas, completed during the past season by Dr. and Mrs. Bullock Workman. Dr. Workman reached 23,399 feet on a fixed peak of 24,486 feet, which gives him the world mountaineering record for men, the greatest height before attained being the summit of Aconcagua, 23,083 feet, the highest of the Andes." —EDITOR.]

Itinerary from Big Trees to Lake Eleanor.

(Furnished by S. H. Smith.)

First Day's Walk.—There is a good trail from Big Trees to Squaw Hollow; thence to Beaver Creek, crossing where there is good trout-fishing; thence easterly to Finnesy's, on Griswold Creek. This is a good camping-place with a fine meadow and pasture for stock, and good hunting can be found in the neighborhood.

Second Day's Walk.—The trail thence leads southeasterly to Shumack's Ranch on Skull Creek; thence, across Fisher's Creek, there is a plain trail southerly to Dry Meadow Ranch, and from there to Baker's Crossing. There is good hunting and fishing at Baker's.

Third Day's Walk.—There is a bridge across the Middle Fork of the Stanislaus River, and a trail runs thence due south to South Fork at Cedar Camp, going thence downstream to the bridge, where a direct road leads to Long Barn. Close at hand is a reservoir, just above the bridge, where there is also good fishing.

Fourth Day's Walk.—From Long Barn, following main road to crossing of the North Fork of the Tuolumne, crossing same at Harding's; thence along wagon road, crossing Wright's and Hull's creeks to Lord's, on Rush Creek. From here the trail leads in a southeasterly direction, crossing Two-Mile Creek and the Middle Fork of the Tuolumne River; thence to Rosasco's on Reed Creek, where good camping can be found.

From Rosasco's to Lake Eleanor, the following day, is but a short tramp.

Trip No. 2.

Instead of going from Dry Meadows Ranch to Baker's Crossing, go from Dry Meadows to Beardslee's Flat, almost due east, where there is good fishing, camps, etc., if party desires to stay several days. There is a good trail from Beardslee's to Parsons or Strawberry. There are good accommodations at Strawberry, hotel and cabins, and fishing and hunting within a half-day's walk. A good trail leads easterly to Bell Meadows, where there is a good camping-ground. The trail from here is southeasterly to Lily Lake. There is a fairly good trail from Lily Lake east to the crossing of the West Fork of Cherry Creek; from here follow the contour of the country due south to Kibbe Lake. This part of the route is quite rough, but will repay the trampers. Kibbe Lake is on the head-waters of one of the streams feeding Lake Eleanor, and about six miles distant.

ALASKA (Vol. III): *Glaciers and Glaciation.* By Grove Karl Gilbert, Harriman Alaska Expedition. 231 + xii pages. New York: Doubleday, Page & Co. 1904.

To the mountaineer who has climbed among glaciers or in glaciated regions this volume will prove most attractive and readable. It is an account of a reconnaissance of the glaciers and glaciated fiords of the Alaskan coast made in the summer of 1899 by the Harriman expedition. The expedition was fortunate in having with it so able a glacialist as Mr. Gilbert. His record of glacial conditions on the Alaskan coast, while from the nature of the expedition only partial, will prove most valuable both for purposes of comparison with earlier records and with those that may be made in future years. The present waning of the glaciers on that coast, together with the manifold evidence of their former seaward extension, renders the region one of the most promising fields for the study of the causes of glaciation, and numerous observations as to the stages of retreat or advance of the glaciers will form part of the necessary data for that study. The book comprises three chapters. The first deals with existing glaciers, the evidence of their retreat, and other features of interest. The second chapter deals with the Pleistocene glaciation of the region, including a discussion of the morphogeny of the region in preglacial time. The third chapter deals with certain general considerations as to glaciers. The book is profusely illustrated, and the pictures, taken in connection with the characteristically lucid style of the author, contribute greatly to the pleasure of reading. A feature of the illustrations is the preponderance of pen-and-ink sketches made from photographs.

[Dr. Gilbert has kindly presented the Club library with this valuable volume.—EDITOR.]

Indians of the Yosemite. By Galen Clark. 110 + xxviii pages. Yosemite Valley Cal. Price, cloth, $1.00; paper, 50 cents.

Mr. Clark has been a member of the Sierra Club for many years, and during the second year of its establishment he had charge of the headquarters of the Club in the Yosemite Valley.

The book gives an interesting account of the history, customs, and traditions of the Indian tribes which frequent the valley; it contains an appendix of useful information for Yosemite visitors, and has tables of distances to points of interest, and gives the heights of all the Yosemite peaks and waterfalls.

The book is illustrated by Chris. Jorgensen and by halftone reproductions from photographs.

The author was the discoverer of the Mariposa Grove of Big

Trees, and for twenty-four years was the guardian of the Yosemite Valley. Thus he is without a doubt one of the best authorities on the beauties of this wonderful valley and the Indians who inhabited it when he first met them in 1855.

[Mr. Clark has kindly presented the Club Library with a copy of his book.—EDITOR.]

Bulletin of the Geological Society of America.

Domes and Dome Structure of the High Sierra. By Dr. G. K. Gilbert, of the U. S. Geological Survey.

A copy of this was also received too late for review in this issue.

The Alaska Boundary. By Professor George Davidson, President of the Geographical Society of the Pacific, and a Director of the Sierra Club. Published by the Alaska Packers' Association of San Francisco.

A copy of this valuable book was received too late for review in this issue of the BULLETIN.

FORESTRY NOTES.

EDITED BY PROFESSOR WILLIAM R. DUDLEY.

AREA OF RESERVES. The latest report of the Commissioner of the General Land Office states that there are now fifty-three forest reserves in the United States, created by Presidential proclamation, and embracing 62,354,965 acres, 2,179,200 acres having been added to the total area during the year preceding June 30, 1903. The final report on the large areas suspended in 1902 in Northern California from sale and entry has not yet been made public, although a few thousand acres included in this suspension have been already returned to the public domain as unsuitable for forest or irrigation reservations. It is reported that the Pine Mountain and the Santa Ynez reservations in Southern California have been joined by reserved land, and in the future the two will be administered under one head, and under the name of the Santa Barbara Forest Reserve.

MANAGEMENT OF THE RESERVES. Some years since the BULLETIN explained the organization of the forest-reserve service, under the General Land Office of the Department of the Interior. It still remains much the same, but an important position has been added, that of "Head-Ranger," who directly supervises the field-work of the several rangers of his district. He must have some technical knowledge, particularly of forest trees, surveying, and timber-scaling, and is appointed only after a formal examination. The change has proved to be a good one. These better-informed, more responsible head-rangers have in cases of vacancies been left to perform the duties formerly assigned to supervisors, to the betterment of the service. Time has proven that the forest-ranger system is a good one, if the men are carefully selected on the basis of merit and a knowledge of their duties. They are expected to patrol the forest, occasionally build or repair trails, prevent or extinguish fires, prevent timber depredations, and the pasturage without a permit of domestic flocks and herds.

The higher officers of the service are expected to determine whether a certain reserve is fitted for pasturage, the number of

stock it will readily support, and to supervise the permits issued by the General Land Office to such as apply for pasturage. They also sell a small amount of timber, generally of an inferior class. Practically, this covers the required duties, aside from clerical and administrative ones, in the forest-reserve service; and it falls short of forestry because there are no men in the service sufficiently well trained to undertake the real problems of forestry on the large scale the reservations demand.

In view of the fact that attempted legislation providing for the transfer of the reserves to the Bureau of Forestry again failed in the late Congress, it is important for us to know the method and results of the present management of the public forests. Is it reasonably safe from unexpected disasters or from defective methods that will bring the forest reserves into disrepute before a transfer to trained hands can be secured.

According to the theory of the present management, protection from fire and from injurious pasturage are by far the most important duties of the service. Regarding pasturage, the facts are as follows: On July 5, 1900, the Department of the Interior issued an amendment to its "Rules and Regulations Governing Forest Reserves," prohibiting the pasturage of sheep and goats on the public lands in the forest reservations, except in Oregon and Washington, in situations where continuous moisture and abundant rainfalls would allow the grazing of sheep. It also provided for the limited pasturage of sheep and goats in a reserve in any State or Territory where, in the judgment of the Secretary of the Interior, it will not work injury to the reserve or the interests dependent thereon. "The pasturing of livestock other than sheep and goats, will not be prohibited in the forest reserves so long as it appears that injury is not being done the forest growth and water supply and the rights of others are not thereby jeopardized." Subsequent amendments stated that "stock of all kinds will receive preference in the following order, viz.: 1. Stock of residents within the reserve; 2. Stock of persons who own permanent stock ranches within the reserve, but who reside outside; 3. Stock of persons living in the immediate vicinity of the reserve, called neighboring stock; 4. Stock of outsiders who have some equitable claim." Grazing is free, and from these permits the United States derives no revenue. Nineteen hundred and one was the first year of pasturage on the reserves under the permit system. In 1901 and 1902 sheep and goats were allowed to enter eight reserves only, one each in New Mexico, Utah, Oregon, and Wyoming, two in Arizona, and two in Washington, aggregating 16,800,000 acres. In 1901 the number allowed on eight reservations was 1,400,000; the number entering, 1,214,418. In 1902 the number allowed, 1,197,000; the number entering,

1,151,278. In 1903 the number allowed, 887,000; the number entering, 812,828; in portions of five newly created additional reservations in New Mexico, Arizona, Montana, and Wyoming, 601,400 were allowed in 1903, and 600,249 actually entered. It will be observed that no permits are granted for sheep pasturage on any of the California forest reserves. Nevertheless, reserves in several States, including California, have been invaded by herders with large bands, in defiance of the regulations. The cases have been brought into the courts, and the decisions noted in previous numbers of the SIERRA CLUB BULLETIN. In the Act of June 4, 1897, Congress evidently intended to give the Secretary of the Interior authority to punish any violation of the regulations it empowered him to make governing the forest reservations. The judge of the United States District Court, Southern District of California, filed an opinion on November 14, 1900, that the Act of June 4, 1897, "in so far as it declares to be a crime any violation of the rules and regulations thereafter to be made by the Secretary of the Interior for the protection of the forest reservations, is in substance and effect a delegation of legislative power to an administrative officer," and therefore unconstitutional. On the other hand, the United States Department of Justice has rendered two written decisions to exactly the opposite effect. The Department of the Interior has no right of appeal in cases of decisions adverse to the United States, and injunction proceedings against sheep trespasses are slow, and in the great mountainous tracts often exceedingly difficult of execution. Advantage of the situation is taken by the sheepmen, no less than 34,000 sheep trespassing on the Sierra Forest Reserve in June, 1903, according to the complaint of the superintendent. The result is great annoyance and a demoralization of the authority of the Interior Department. Congressional action, making it a criminal offense to pasture stock on a reserve without a permit would be the simple and effective remedy. A bill for the protection of the public forest reserves and national parks passed the House on April 23d, but the Senate has taken no action, so far as can be learned.

In 1901 pasturage of horses and cattle was allowed in thirty-two reserves, permits being given to 277,621 head; in 1902 pasturage was given 357,552 head in thirty-seven reserves; and in 1903 pasturage was given 529,973 head in forty-four reserves. Cattle and horses have been allowed in the eight reserves open to sheep pasturage; also in all the California reservations. The following are the California statistics on this subject. The total amount of the reserves in this State is 8,853,129 acres,—in Northern California, 4,923,535; in Southern California, 3,929,-594 acres.

GRAZING OF HORSES AND CATTLE IN CALIFORNIA RESERVES.

	1901.		1902.		1903.	
	No. Allowed.	No. Entering by Permit.	No. Allowed.	No. Entering by Permit.	No. Allowed.	No. Entering.
Northern California	40,500	35,145	53,000	48,144	54,600	.....
Southern California	Only Stock in or near Reserves.	5,751	15,150	10,641	13,100	.....
Total.....	.....	40,896	68,150	58,785	67,700	.....

During the present season permits were granted before April first.

Regarding this general question, it will be observed that the Department has taken a most important step in regulating grazing on the forest reserves, according to the number the area will more than readily support without injury to forest cover or the streams. In the California statistics it is evident that the effort is to discriminate in favor of the thinly wooded and almost arid mountains of Southern California. The weak spot is the open defiance in some regions of the regulations rightly limiting grazing, the weakness of the law no doubt being locally increased through the connivance of venal forest rangers. Under the Bureau of Forestry we might expect an immediate change in both respects. The Sierra Club has been very jealous of the Sierra forests. It intends to labor for the transfer of the reserves to the Bureau of Forestry at the next session of Congress, as it has done in the past; and if any one camping in the mountains learns of overgrazing in any locality, or of the dereliction of rangers, he should make it known.

Apparently the United States has a far better system for controlling forest fires within its reserves than exists under any State government. New York has done far more than any other State in acquiring lands avowedly for stream protection. These lie in the Adirondack and Catskill mountains. Several million dollars have been spent, and the State owns 1,163,414 acres in the Adirondack Park alone; but at present it is committed to two things which are absurd, antiquated, and which threaten the very existence of what seemed during the period of legislative appropriation and purchase an enlightened forest policy. It makes no provision for the removal or use of timber in any part of its preserves; it even forbids tree-cutting; and it has no paid patrol to protect its forests from fire. It has fire-wardens, but they are paid only for the time actually spent in fighting

fires. The State ignores the fact, well understood in the West, that it is far greater economy to employ a regular patrol to watch for and extinguish fires in their early stage than to pay large bills for fighting forest conflagrations. This is best illustrated by the destructive fires in the Adirondacks in 1903, and a comparison with the forest-reserve fires in California in 1902, the last season for which we have detailed statistics. In the Eastern States a long drouth existed from April 20th to June 8th. During that time fires became frequent, and finally almost uncontrollable in the northern and western parts of the Adirondacks, although all but twelve per cent originated on private lands. This carnival of fire was only ended by the heavy rains which broke the drouth. In an area of about 7,000 square miles, or 4,480,000 acres, 600,000 acres were burned over, involving a cost to the State for fire-fighting alone of $175,000, a direct loss of property of $3,500,000, and a very great but unknown indirect loss in the way of young forest growth, of fish, young animals, birds, etc.* In California, in an area of 8,853,129 acres (the forest reserves), 7,895 acres were burned over in 1902 during the dry season of from four to five months. The extra cost for fighting these fires was $1,080; but add to this the entire salary and expense list of the forest reserve service for that year,—viz., $76,281,— and we have only $77,381. The California drouth is nearly three times as long as that of 1903 in New York, the area under consideration twice as great, but the real cost for fighting fire was a small fraction of the $175,000 paid out in New York. There are times, of course, when serious and costly fires invade the reserves, but nearly always from the outside,—as an instance, the destructive Mt. Wilson fire in Southern California a few years since, started on Baldwin's Santa Anita Ranch. As a rule, every year shows a decrease in acreage and a decrease in number of the real forest fires in the California reserves. This is due to the efficiency of the patrol, the printed warnings of heavy fines, and the careful explanations given campers concerning methods of treating their campfires and the effects of destructive fires on the forest. There is no doubt that Californians are better informed about these matters and more careful than formerly; and this education is due chiefly to the forest-reserve regulations, which are based on expert advice from the Government foresters.

* "Forest Fires in the Adirondacks in 1903," by H. M. Suter, U. S. Bureau of Forestry, 1904.

CALIFORNIA'S POLICY APPROVED.

So far as it has gone, California has pursued a wiser course in regard to forestry matters than any other State. It has supported the United States in every movement to preserve the Nation's Sierra forest, and its appropriation of money at the last legislature to aid the Government forester in investigating the forests of California and devising, on the basis of such scientific knowledge, a plan of treatment and a plant of fire-control that shall be the best that science can give us, is everywhere spoken of as the most enlightened policy yet adopted by a State. The special committee of the New York legislature appointed to consider the best method of repairing the disasters of 1903, advises a forestry policy and co-operation with the Bureau of Forestry, after the plan adopted by California. *Forestry and Irrigation* says: "The creation of the Adirondack and Catskill mountain preserves was a long step in advance, but it must be followed by more progress if the work is to be kept abreast of that now inaugurated by California."

CONGRESSIONAL INACTION.

Although a larger number than usual of bills affecting California lands and forests were before Congress, none of importance came up for final action. The old game of "Do nothing the year before a Presidential election" was played. The transfer of the forest reserves to the Bureau of Forestry, the purchase of the Calaveras Groves, the repeal of the Timber and Stone Act, of the Commutation Clause of the Homestead Law, the modification of the Desert Land Law, the protection of the reservations, were all brought before Congress for action, but Congressional leaders bandied them about in committees until it was "time to go home." Every one failed, although it is certain that some of the most important would have passed if they could have been brought to a vote. The Calaveras Grove bill suffered from too many putative relations. The advocates of the great Appalachian Park and the White Mountain Forest Reserve were lying in wait until the energy of the California Club should carry through the Calaveras Grove bill. In that event every effort would have been used to make the latter a precedent. Members of Congress were very well aware of this. The Calaveras Grove question is not in the same class of the others, as a matter of fact. Even if the forests of the Appalachians were all swept away, one century or two would with care restore their pristine greatness and beauty. Not so with the Calaveras Big Trees. The growth of two thousand years would and could never be replaced.

President Roosevelt, in both general and special messages to

Congress, vigorously commended all of the above measures. The Public Lands Commission (Messrs. Pinchot, Newell, and Commissioner Richards of the General Land Office, the ablest and most conscientious students of the questions in the country), in its report to the President, which he transmitted to Congress with letter of approval March 7, 1904, strongly recommends the repeal of the Timber and Stone Act and the distinct modification of the Desert Land Law; it was not prepared to formulate the needed reform in the commutation section of the Homestead Law. It is under cover of these laws that many frauds of land speculators have been attempted and fully consummated during the past five years. It has been done by evading the original intent of the law in ways both legal and illegal. Thousands of acres of timber land have thus passed from Government control into the hands of millionaire investors for a ridiculously small sum, when it was intended that only quarter-sections or thereabouts should go to a single person, for his own domestic and home-building purposes. To show how rapidly the public lands are disappearing, and under what entries, we have compiled a table from the records of the General Land Office, embracing all the chief sources of loss, excepting State and railroad selections. We cannot show, however, what is testified to by others,—that much of this land has passed in large tracts into the hands of the rich, and not into the possession of the small landholder. It will be seen that during the fiscal year closing June 30, 1903, nearly 23,000,000 acres of public land, chiefly west of the one-hundredth meridian, and much of it the timber land of the Pacific Slope, was disposed of. This is more than one third the entire amount now embraced in the forest reservations.

CASH SALES OF PUBLIC LAND IN THE UNITED STATES.
(*By acreage.*)

	1899.	1900.	1901.	1902.	1903.
	Acres.	Acres.	Acres.	Acres.	Acres.
Timber and Stone Entries.	59,019	300,019	396,445	545,253	1,765,222
Mineral Land Entries	39,752	55,626	67,036	97,657	97,046
Desert Land Entries.....	350,251	590,155	686,382	929,230	1,025,825
Homestead Entries.....	.....	8,478,409	9,479,275	14,033,245	11,193,120
Homestead Entries Commuted to Cash..... ...	505,472	552,564	716,661	1,105,850	2,194,991
Total Acreage disposed of under all Entries	9,182,413	13,453,887	15,562,796	19,488,535	22,824,299
Excess Over the Previous Year.....	728,517	4,271,474	2,108,908	3,925,739	3,335,764

The amount disposed of in 1898 was 8,453,896 acres, showing that the greatest activity in public-land sales in recent years occured during the fiscal year of 1899-1900, the year when the

. men of the T. B. Walker and H. H. Yard type were to be met with in Northern California, exploring the forests with troops of timber-cruisers. They came from the exhausted forests of the East. This was the year when the American Forestry Association, at the request of members of the Sierra Club, passed a resolution requesting the creation of a forest reserve to extend from Lake Tahoe around the entire head-waters of the Sacramento Valley. The Sierra Club has never been less than five years ahead of public opinion, but California has moved with almost equal promptness, and we shall eventually see the success of most we ardently desired in forest conservation.

It is apparent from the table that the passage of the National Irrigation Act on June 13, 1902, and anticipation of this event, stimulated excessive activity under the three most defective of our land laws. We have a very grave duty to perform in the light of these statistics. The rights of the men of average property and financial ability seem to be at stake in the West. Laws should not stand which enable one class to overreach another, particularly in the matter of acquiring land, the foundation of a State's prosperity. We can encourage discussion of this subject everywhere; we can advise the Government to liberal suspension or reservation of public land during the current year; we can finally use every means in our power to induce Congress to revise our land laws, at its next session, in accordance with the expert opinion of the Public Lands Commission, and in harmony with the excellent intent of the National Irrigation Act.